

Azure Migration

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Partner Technology Strategist



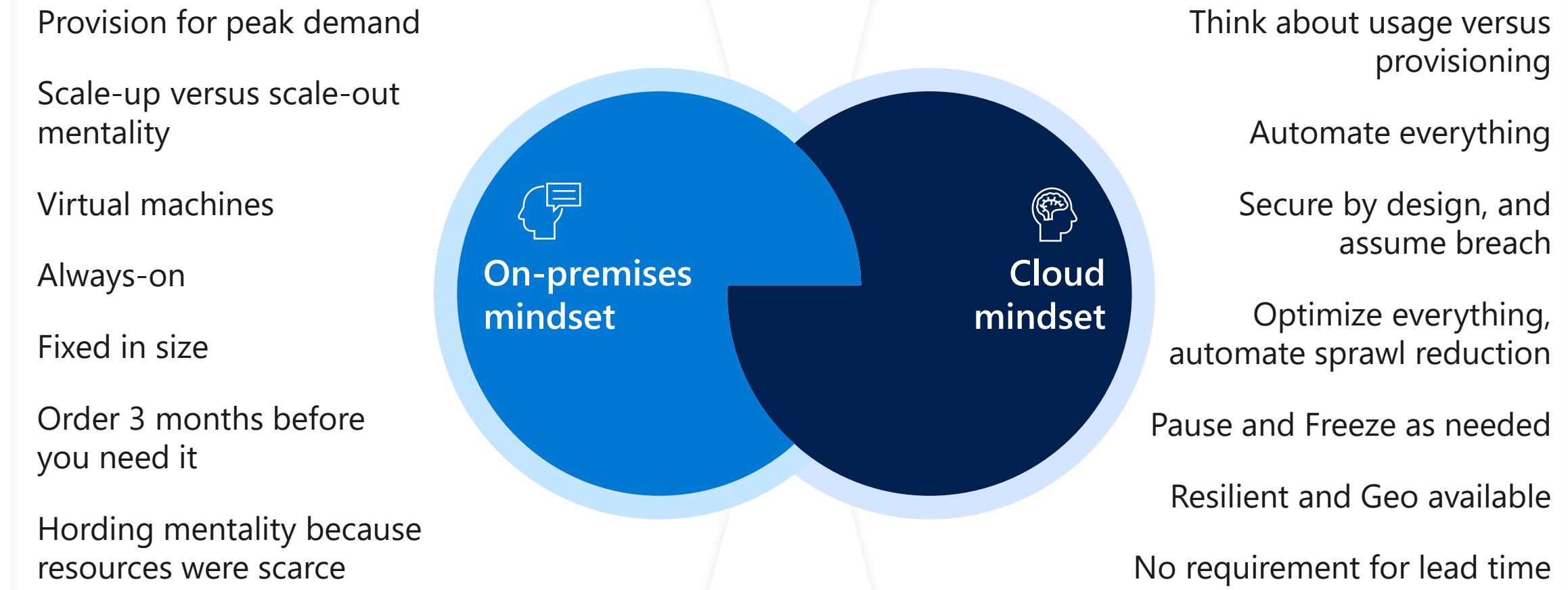
Agenda

- 1 Introductions**
- 2 Migration Strategies & Approach**
- 3 Migration Tools**

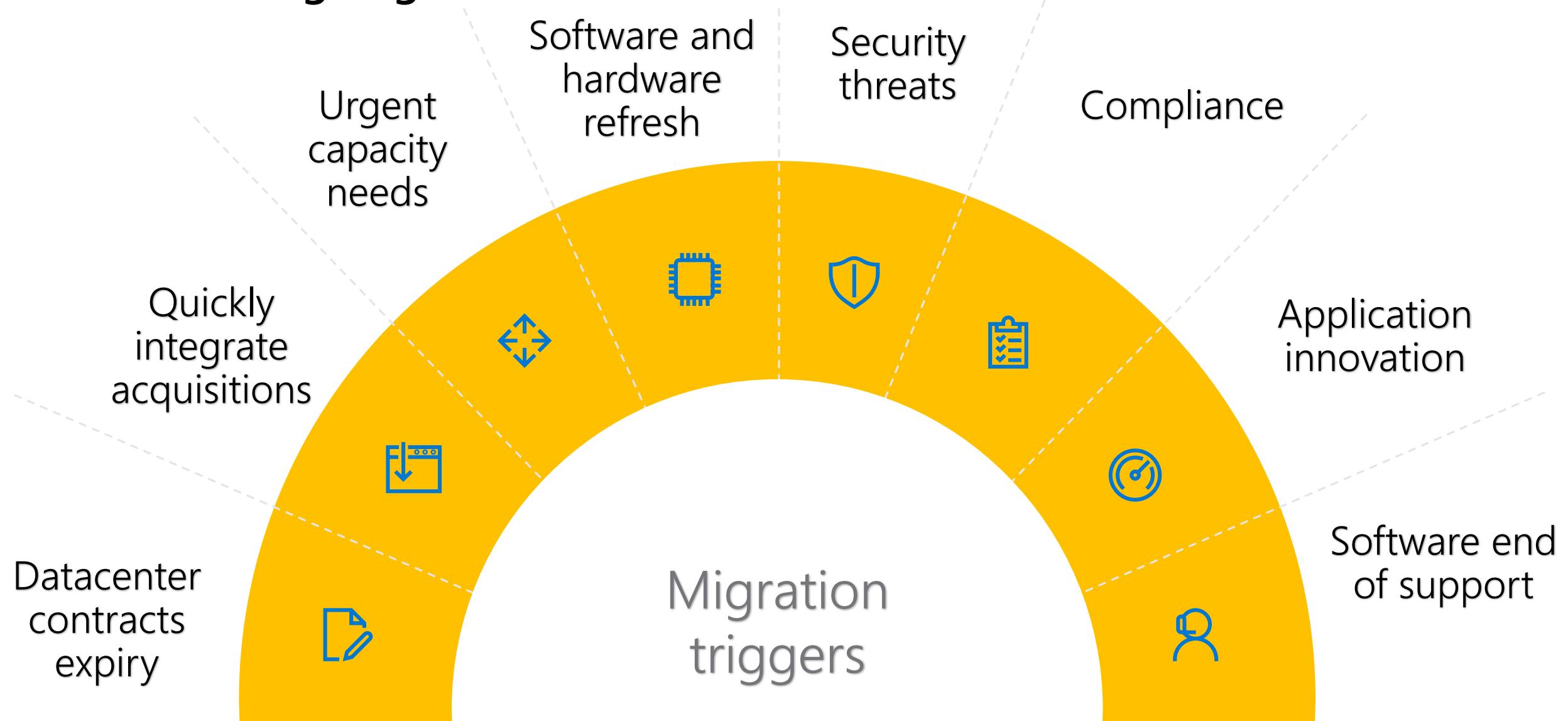
Migration Strategies & Approach



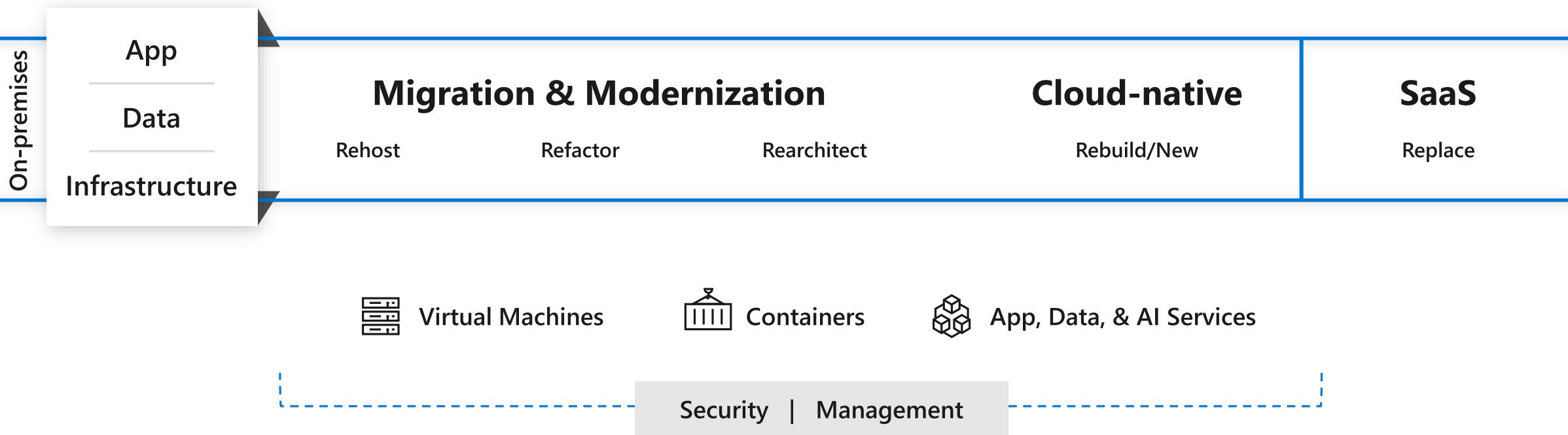
On-premise vs Cloud mindset



What's Driving Migrations?



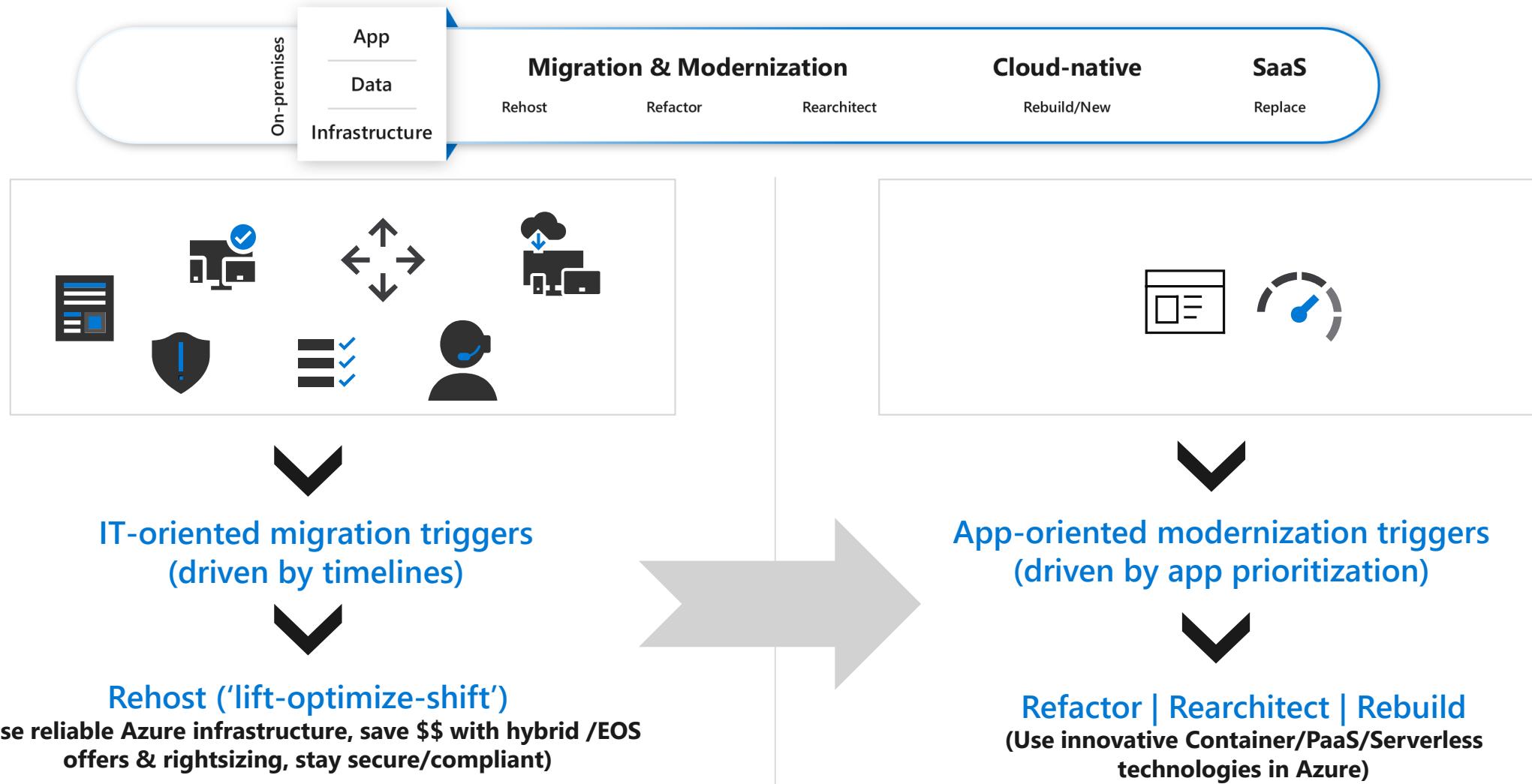
Azure migration & modernization scenarios



Cloud migration & modernization strategies

	Rehost	Refactor	Rearchitect	Rebuild
Description	Redeploy as-is to cloud	Minimally alter to take better advantage of cloud	Materially alter/decompose application to services	New code written with cloud native approach
Drivers	<ul style="list-style-type: none">Reduce CapexFree up datacenter spaceQuick cloud ROI	<ul style="list-style-type: none">Faster, shorter, updatesCode portabilityGreater cloud efficiency (resources, speed, cost)	<ul style="list-style-type: none">App scale and agilityEasier adoption of new cloud capabilitiesMix technology stacks	<ul style="list-style-type: none">Accelerate innovationBuild apps fasterReduce operational cost
Technologies	IaaS	Containers PaaS		PaaS Serverless Microservices

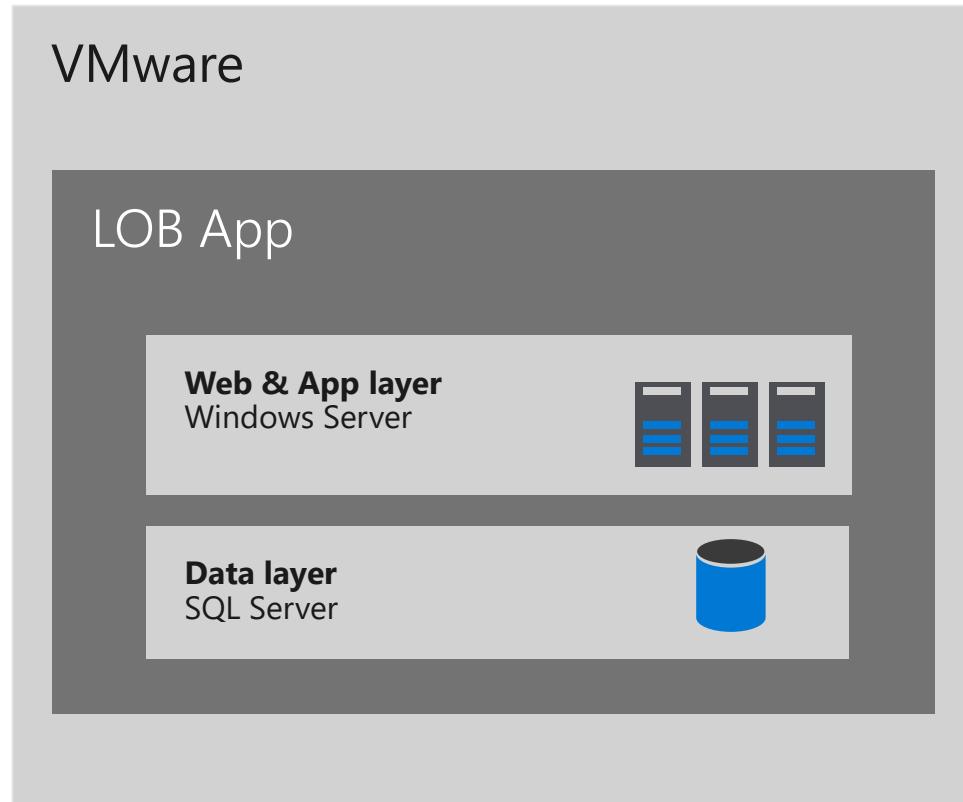
Customer transformation journey: Ops efficiency focus ("get out of on-prem DC by<dd/mm/yy")



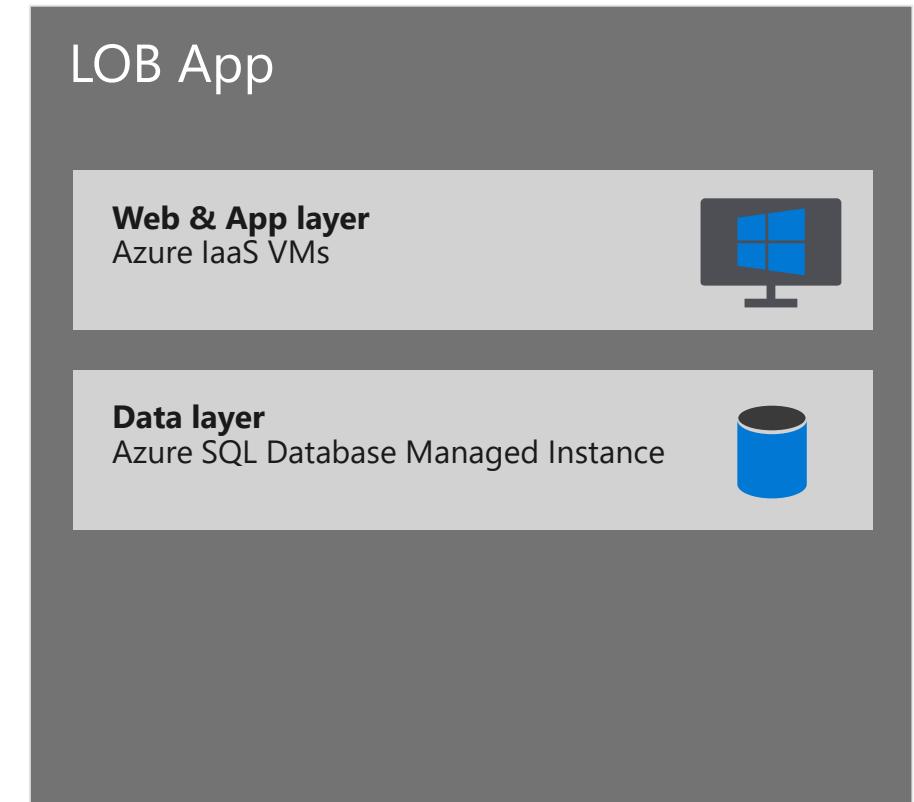
Define migration projects with deadlines to address customer urgency
Group 3-5 related apps/workloads in each project; avoid lengthy assessments

Application Migration – Azure IaaS and Azure SQL Database Managed Instance (MI)

On-premises



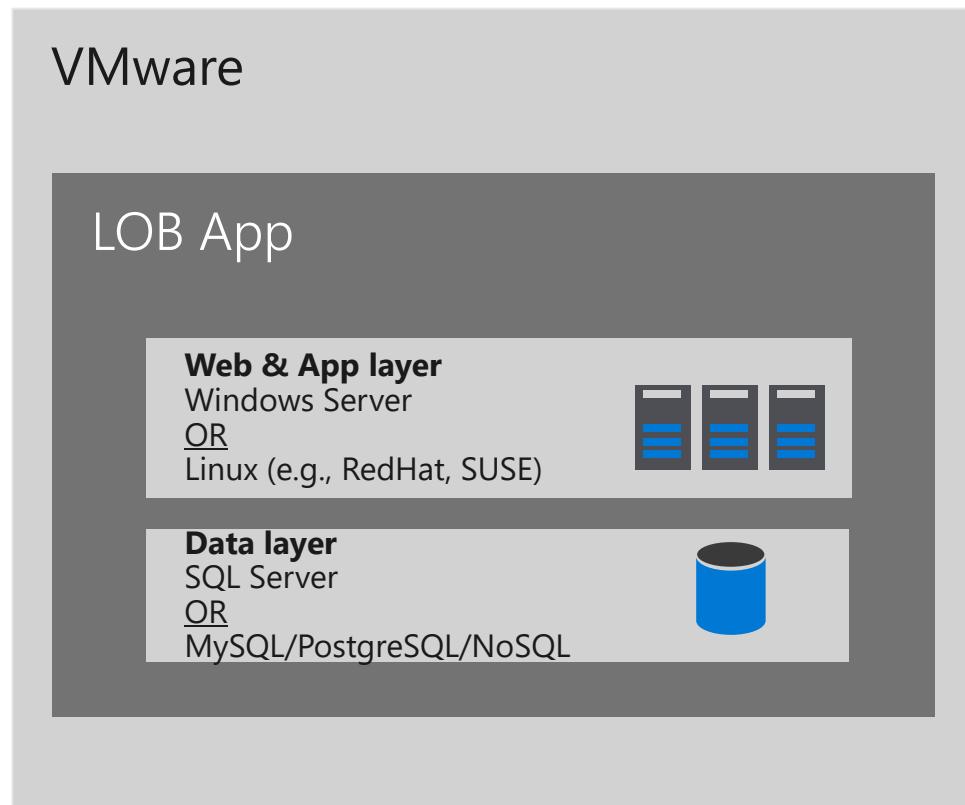
Azure



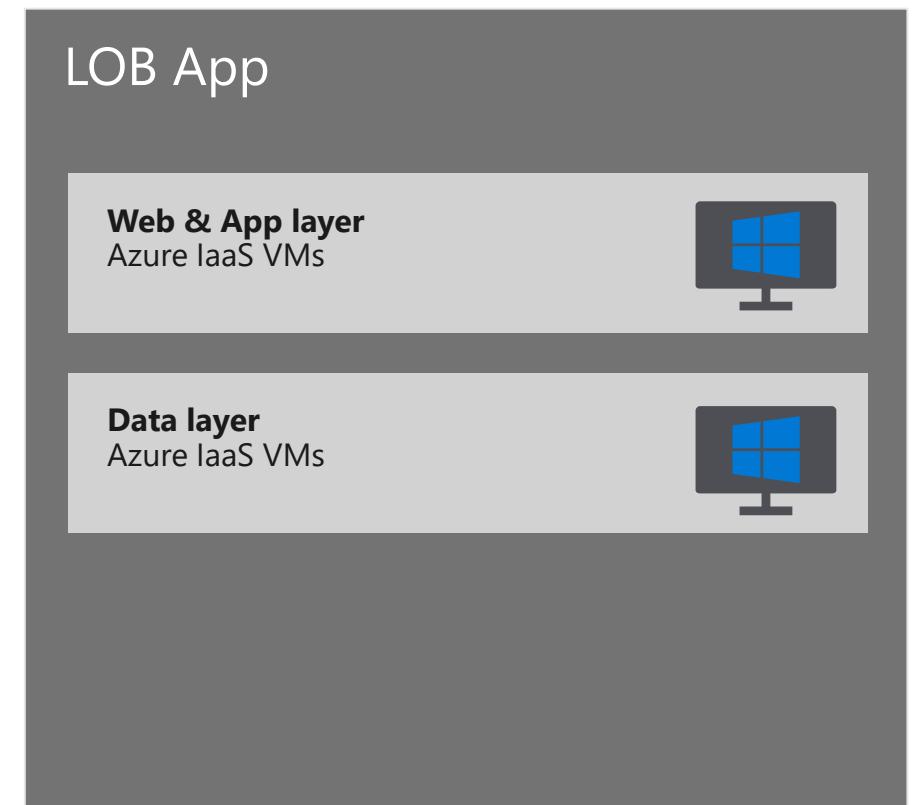
Documentation: https://aka.ms/rehostapp_model1

Application Migration — Azure IaaS

On-premises



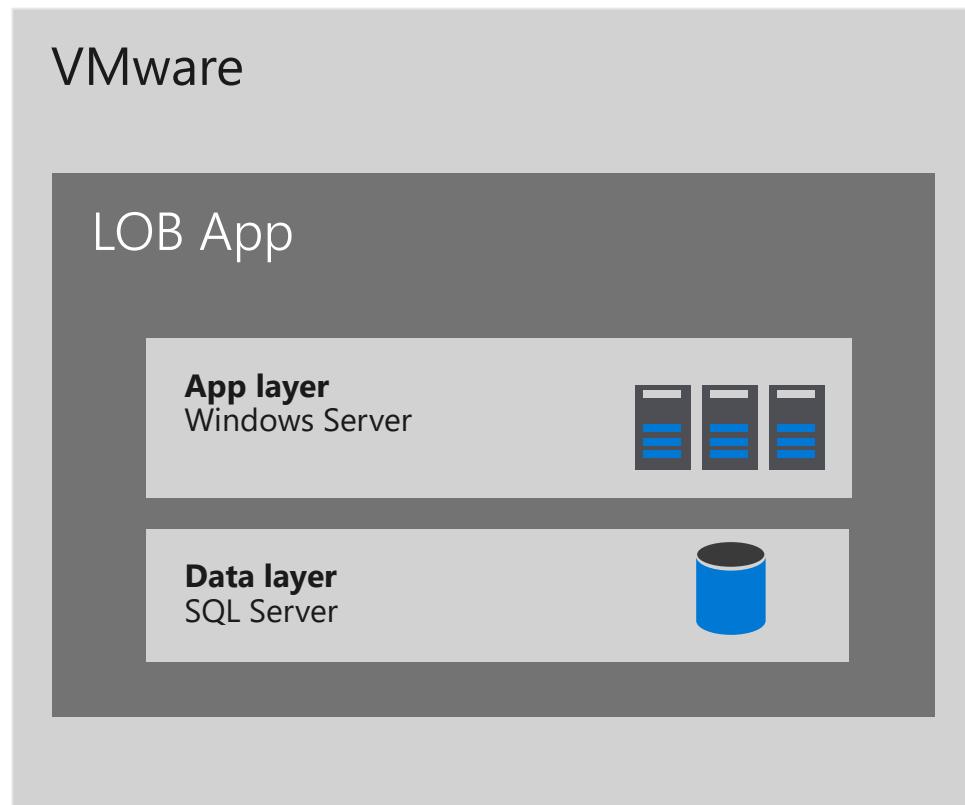
Azure



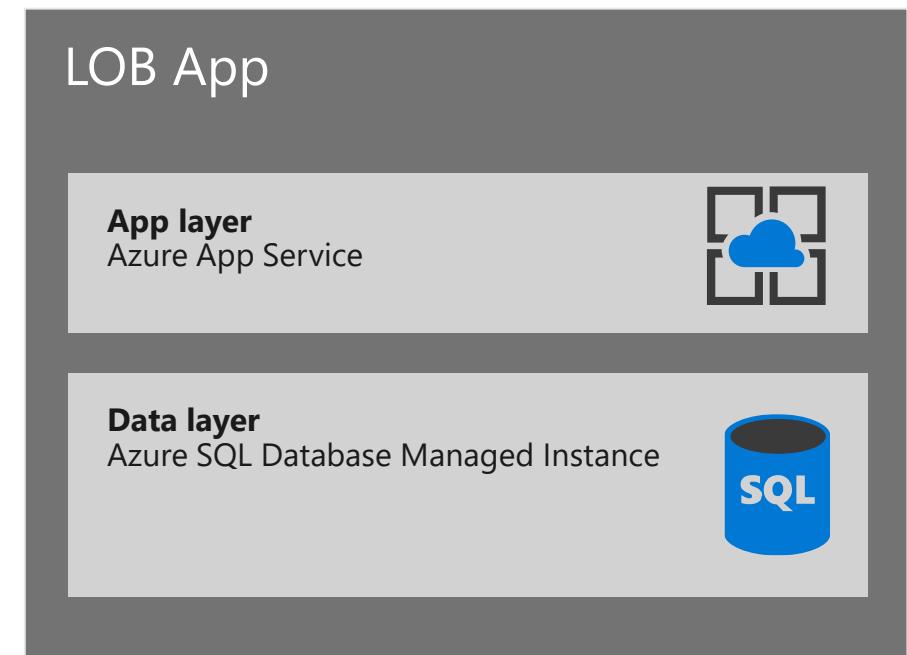
Documentation: https://aka.ms/rehostapp_model2

Application Migration — App Service and Azure Database SQL Managed Instance (MI)

On-premises



Azure



Azure migration experience



Assess



Migrate



Optimize



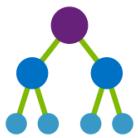
Secure and manage

[Migration tools](#) | [Azure migration center](#) | [Scenario guidance](#) | [FastTrack for Azure](#) | [Azure Expert MSPs](#)

Best practices: People | Planning | Technology

Azure Fundamentals: Governance

Governance becomes very critical as you scale Azure migration efforts



Management Group



Policy



NEW

Blueprints



NEW

Resource Graph



NEW

Cost Management

Define organizational hierarchy

Real-time enforcement, compliance assessment and remediation

Deploy and update cloud environments in a repeatable manner using composable artifacts

Query, explore & analyze cloud resources at scale

Monitor cloud spend and optimize resources

Hierarchy

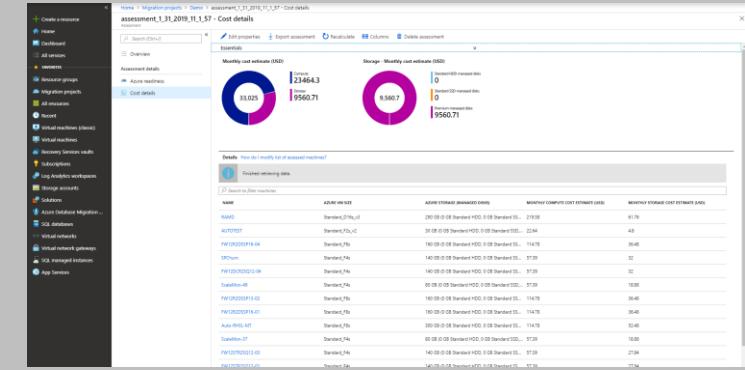
Control

Environment

Visibility

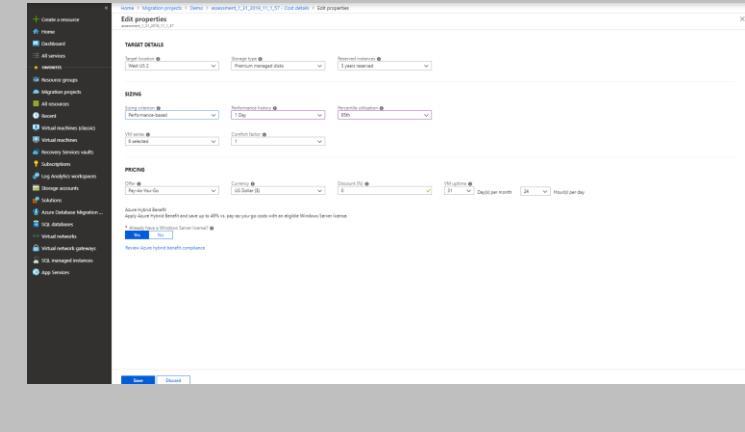
Consumption

Continuously optimize resources during and after migration



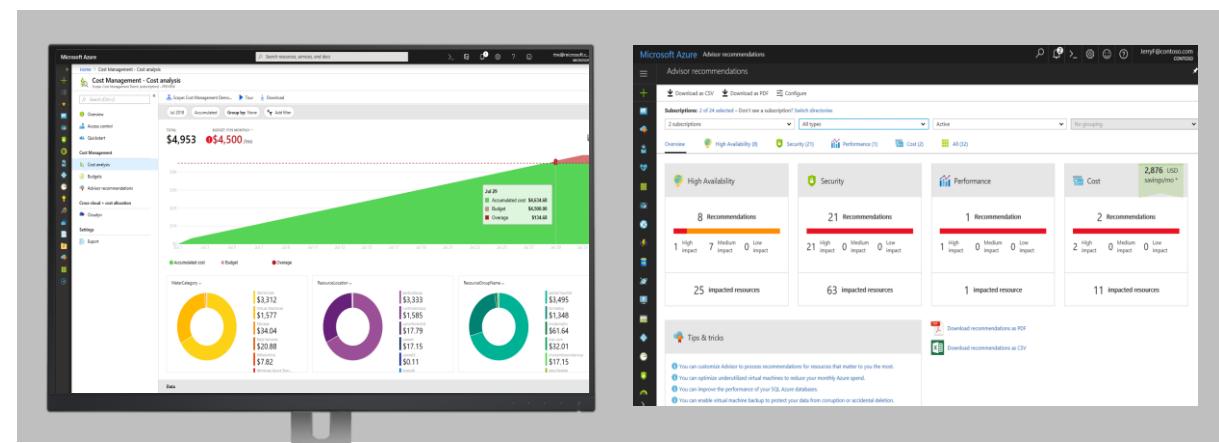
As you move

- Right-size Azure resources based on assessment guidance
- Use Azure Hybrid Benefit and Azure Reserved Instances to save money



After you move

- Unified experience to optimize cloud spends: Azure Cost Management
- Azure Advisor: Built-in best practice recommendations (e.g., turn off idle VMs)



Modernize for longer term value

Keep migrated workloads secure and managed

Built-in, intelligent services for Azure and on-premises workloads



Governance

Proactively apply policies and optimize cloud spend



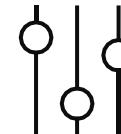
Security

Industry leading Security with Advanced Threat Protection



Resiliency

High availability and protection for VMs, apps and data



Monitoring

Deep operational insights with rich intelligence



Automate

Powerful scripting, configuration and update management

Turn on security, backup, and monitoring for every migrated resource

Migration approach: Best practices



People

- Drive org culture change
- Set up migration center of excellence (CoE)
- Ensure right stakeholders are engaged
- Provide learning paths & certifications
- Use skilled migration partners



Planning & process

- Build biz case w/ exec sponsorship
- Plan migration strategies
- Start small: Do a pilot
- Track migration scorecard
- Track and optimize cloud spends



Technology

- Govern Azure environments & resources
- Extend networking/identity to Azure
- Establish robust security foundation
- Evolve workload management approach
- Choose migration tools best suited for the job

[Best practice details on Azure migration center](#)

Best practice example: Use TCO reports to showcase cost savings of moving to Azure (vs. on-premises)

Save up to 78%*



Datacenter migration TCO vs. on-premises

VMware VMs → IaaS

Save up to 68%*



Rehost application on Azure

Windows/SQL → IaaS/SQL DB MI
Linux/MySQL → IaaS/MySQL

Save up to 63%*



Rearchitect application on Azure

Windows/SQL → App Service/SQL DB MI
Linux/ MySQL → App Service/MySQL

Migrate EOL/EOS servers to Azure: [>\\$750K TCO savings over 3 years for 100 VMs*](#)

Tools

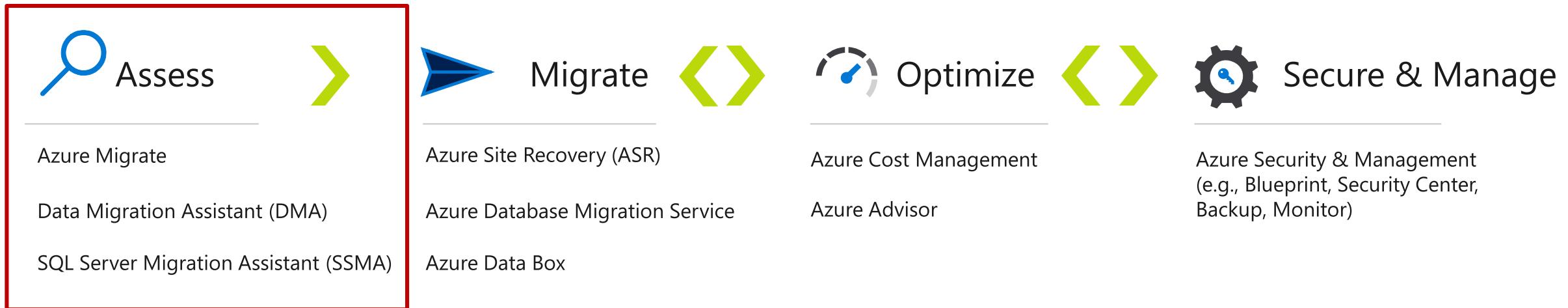


Azure Migrate



Choice of tools for every stage and every requirement

Goal is successful Azure migration: Pick the right tool for the job



We embrace ISV solutions



Assess your environments with Azure Migrate

App performance history

App configuration data

Applicable discounts and offers
(e.g., Azure Hybrid Benefit, RI)

Target Azure location



Azure Migrate



Azure suitability analysis
(e.g., compatibility)

Rightsized Azure resource model

Azure cost estimates

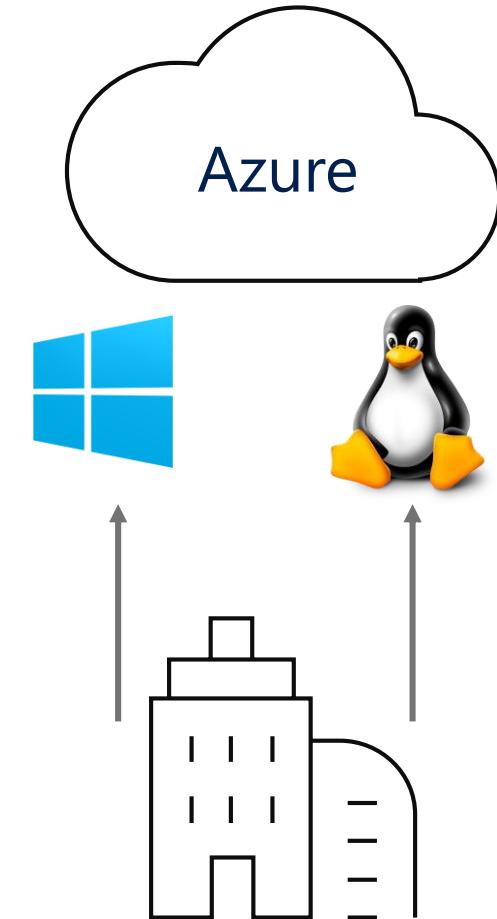
App dependency map

Agentless, VMware & **New** Hyper-V assessments | Free, built in service | Quick same day assessment | Rich Optimizations

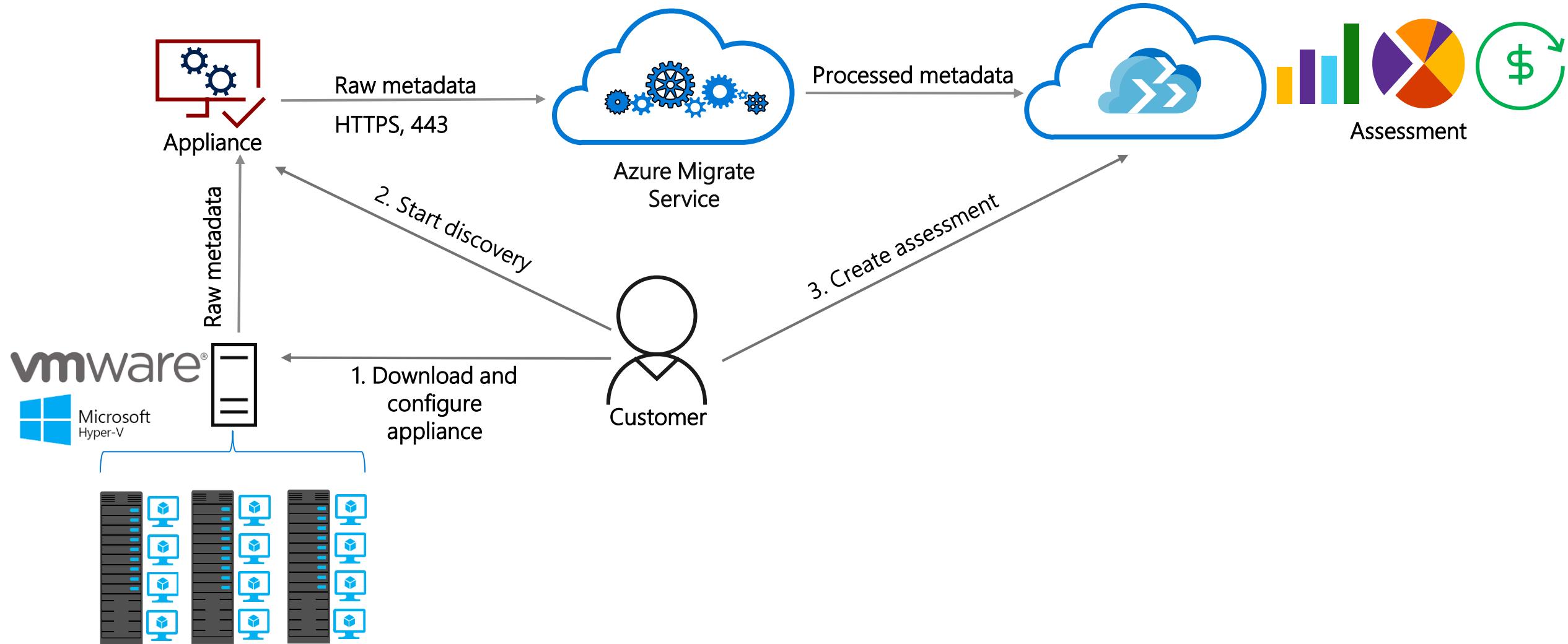
Azure Migrate for Discovery and Assessment

What does it do?

- Easily **discover** on-premises **VMs and applications**, including application dependencies
- Insightful workload **assessments**:
 - Azure suitability analysis
 - Right-sized Azure resources based on utilization history
 - Estimated cost in Azure
 - Migration risks and recommended tools
 - Support for Vmware, Hyper-V and **NEW** Physical Servers



How Azure Migrate Works



Documentation: <http://aka.ms/azurermigrate/documentation>
Videos: <https://aka.ms/migrate/video>

Recent Enhancements

Sizing	<p>Target location Performance-based sizing NEW Continuous discovery and profiling NEW As on-premises sizing NEW Option to specify VM series NEW Option to specify storage type for Single VM SLA NEW Confidence rating</p> <div style="border: 1px solid blue; padding: 5px; margin-top: 10px;"> Support Matrix</div>
Cost estimation	<p>Azure Hybrid Benefit Azure Offers Custom Discount Currency NEW Reserved Instances NEW VM uptime</p> <p>https://aka.ms/migrate/targetregions</p>
Migration target locations	<p>Azure commercial regions NEW Azure Government, Germany and China</p>
Azure platform support	<p>Managed Disk Large disk support NEW Windows Server 2008 (32 & 64-bit support)</p>

Azure Migrate Demo

Azure Migrate – Servers

Microsoft

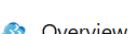
 Search (Ctrl+ /)[Assessment tool](#) [Migration tool](#) [Refresh](#)

This page does not refresh automatically. Click on "Refresh" to update the page.

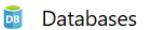
Last refreshed at: 3/8/2019, 12:27:54 PM

Subscription: ASR Canary Test Subscription 1

Migrate project: SnehaWalkthrough



Migration goals

[Servers](#)[Data Box](#)

Manage

[Discovered items](#)

Support + troubleshooting

[New support request](#)

Assessment tools

**Corent Tech**[Connect to Azure](#)

Quick start

1: Register

Procure license for Corent Tech or start with a free trial of Corent Tech.

2: Connect

Click on "Connect to Azure Migrate" and follow the listed steps to connect your Corent Tech workspace to Azure Migrate.

Azure Migrate: Server Assessment

[Discover](#) [Assess](#) [Overview](#)[Discovered servers](#) 8989[Groups](#) 3[Assessments](#) 3

Next step: You can refine your application grouping with dependency analysis

Migration tools

**Zerto**[Connect to Azure](#)

Azure Migrate: Server Migration

[Discover](#) [Replicate](#) [Migrate](#) [Overview](#)

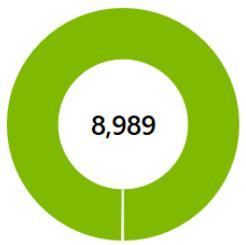
assessment_12_26_2018_13_28_1 – Azure readiness

Assessment

[Edit properties](#) [Export assessment](#) [Recalculate](#) [Columns](#) [Delete assessment](#)

Essentials

Azure readiness



Ready for Azure
8989

Ready with conditions
0

Not ready for Azure
0

Readiness unknown
0

[Details](#) How do I modify list of assessed machines?

[< Previous](#) Page 1 of 600[Next >](#)

NAME	AZURE VM READINESS	AZURE VM SIZE	SUGGESTED TOOL	OPERATING SYSTEM	BOOT TYPE	DISKS ON-PREMISES	STORAGE ON-PREMISES (GB)
NestedScaleVM1161	✓	Standard_A8_v2	Azure Site Recovery	Microsoft Windows Server 2...	BIOS	12	0.05
NestedScaleVM1188	✓	Standard_A8_v2	Azure Site Recovery	Microsoft Windows Server 2...	BIOS	12	0.05
NestedScaleVM1167	✓	Standard_A8_v2	Azure Site Recovery	Microsoft Windows Server 2...	BIOS	12	0.05
NestedScaleVM1193	✓	Standard_A8_v2	Azure Site Recovery	Microsoft Windows Server 2...	BIOS	12	0.05
NestedScaleVM1162	✓	Standard_A8_v2	Azure Site Recovery	Microsoft Windows Server 2...	BIOS	12	0.05
NestedScaleVM1168	✓	Standard_A8_v2	Azure Site Recovery	Microsoft Windows Server 2...	BIOS	12	0.05
NestedScaleVM1169	✓	Standard_A8_v2	Azure Site Recovery	Microsoft Windows Server 2...	BIOS	12	0.05
NestedScaleVM1179	✓	Standard_A8_v2	Azure Site Recovery	Microsoft Windows Server 2...	BIOS	12	0.05
NestedScaleVM1175	✓	Standard_A8_v2	Azure Site Recovery	Microsoft Windows Server 2...	BIOS	12	0.05

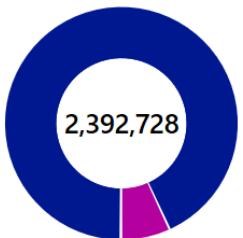
assessment_12_26_2018_13_28_1 – Cost details

Assessment

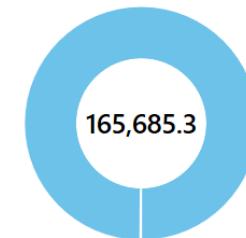
[Edit properties](#) [Export assessment](#) [Recalculate](#) [Columns](#) [Delete assessment](#)

Essentials

Monthly cost estimate (USD)



Storage - Monthly cost estimate (USD)



Details [How do I modify list of assessed machines?](#)

[< Previous](#) Page 1 of 600[Next >](#)

NAME	AZURE VM SIZE	AZURE STORAGE (MANAGED DISKS)	MONTHLY COMPUTE COST ESTIMATE (USD)	MONTHLY STORAGE COST ESTIMATE (USD)
NestedScaleVM1161	Standard_A8_v2	384 GB (384 GB Standard, 0 GB Premium)	247.75	18.43
NestedScaleVM1188	Standard_A8_v2	384 GB (384 GB Standard, 0 GB Premium)	247.75	18.43
NestedScaleVM1167	Standard_A8_v2	384 GB (384 GB Standard, 0 GB Premium)	247.75	18.43
NestedScaleVM1193	Standard_A8_v2	384 GB (384 GB Standard, 0 GB Premium)	247.75	18.43
NestedScaleVM1162	Standard_A8_v2	384 GB (384 GB Standard, 0 GB Premium)	247.75	18.43
NestedScaleVM1168	Standard_A8_v2	384 GB (384 GB Standard, 0 GB Premium)	247.75	18.43
NestedScaleVM1169	Standard_A8_v2	384 GB (384 GB Standard, 0 GB Premium)	247.75	18.43
NestedScaleVM1179	Standard_A8_v2	384 GB (384 GB Standard, 0 GB Premium)	247.75	18.43
NestedScaleVM1175	Standard_A8_v2	384 GB (384 GB Standard, 0 GB Premium)	247.75	18.43

Edit properties

assessment_12_26_2018_13_28_1

TARGET PROPERTIES

Target location West US 2

Storage type Standard HDD managed disks

Reserved instances No reserved instances

VM SIZE

Sizing criterion As on-premises
Performance-based
As on-premises
19 selected

Performance history Not applicable

Percentile utilization Not applicable

Comfort factor 1

PRICING

Offer Pay-As-You-Go

Currency US Dollar (\$)

Discount (%) 0 ✓

VM uptime 31 Day(s) per month 24 Hour(s) per day

Azure Hybrid Benefit

Apply Azure Hybrid Benefit and save up to 49% vs. pay-as-you-go costs with an eligible Windows Server license.

* Already have a Windows Server license?

Yes No

[Review Azure hybrid benefit compliance](#)

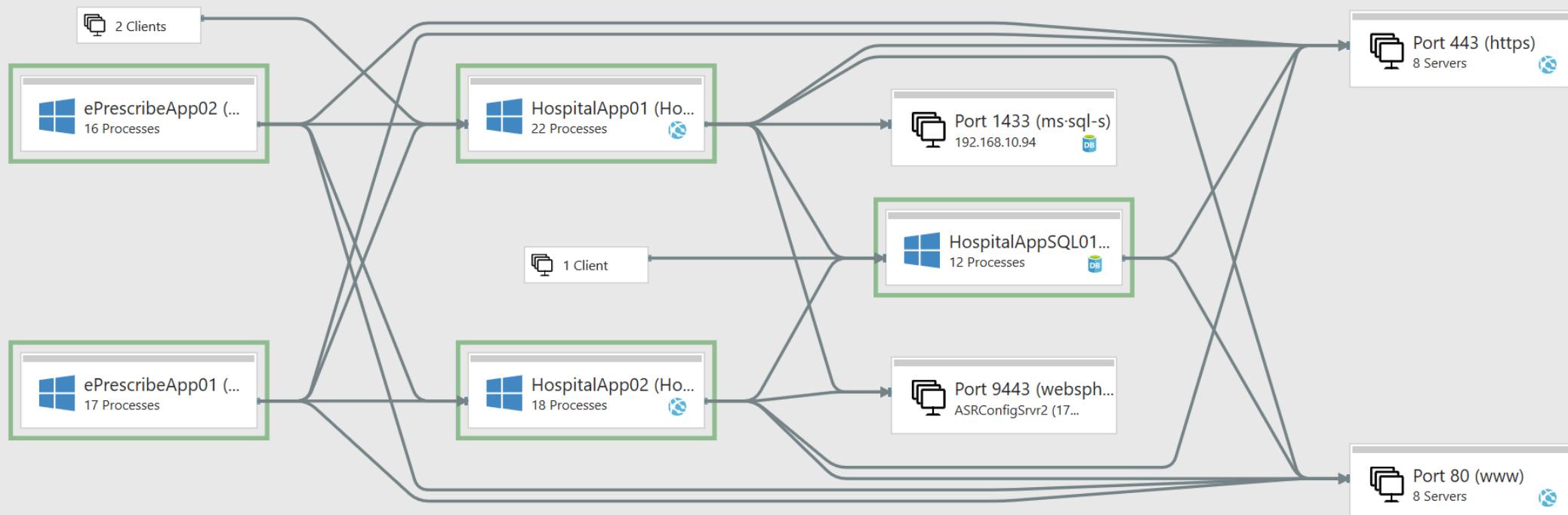
Dependencies

HospitalApp

[Add machine\(s\)](#) [Remove machine\(s\)](#) [Refresh](#) [Configure agents](#)

ⓘ Use Ctrl + Click to multiselect machines on the map to add or remove from the group.

🕒 Time Range: 3/8/2019 11:42 AM — 12:42 PM (1 hour)

[Legend](#) [Filter](#) [Reset](#) [Help](#)

FAQ

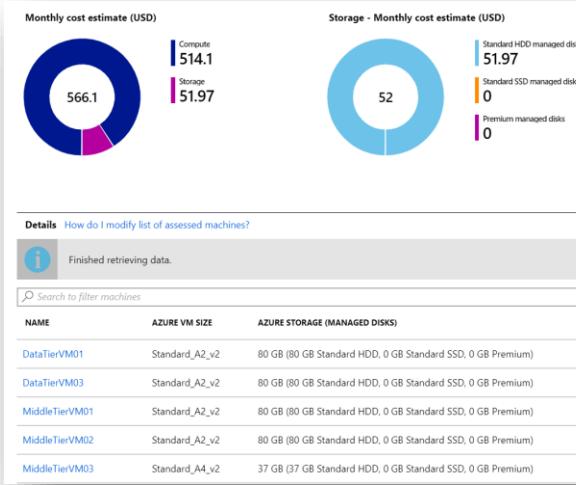
- Azure Migrate allows discovery of only 1500 servers/project
 - Current preview allows 10,000 servers/project and soon will extend to 35,000/project
- Azure Migrate is not available in my region
 - Azure Migrate service supports creating assessments for ALL Azure Target locations as part of assessment properties
 - Azure Migrate service is deployed in US, Europe, Asia and Gov where customer meta data is stored.
 - For actual server migrations, ASR is deployed in ALL Azure Target Locations.
- Data Security & Licensing audit concerns
 - Microsoft does NOT use this data in relation to any licensing compliance audit.
 - Azure Migrate data is encrypted in transit as well as at rest
- My customer prefers an Agentless assessment solution
 - Azure Migrate is an agentless discovery and assessment solution.
 - Only optional application dependency view capability which leverages Service Map needs an agent install.
- My customer wants to optimize as part of Migrations
 - Azure Migrate performs rich continuous profiling of workloads to provide rightsizing recommendations for optimizations
- Does Azure Migrate do migrations too? Or is it ASR?
 - We will be delivering a unified experience in Q4, which will make Azure Migrate be the single stop shop for all migration needs, right from discovery, assessments to doing the actual move. We will bring in ASR technology into the Azure Migrate experience. Until then leverage ASR.
- When will we have physical server assessments?
 - They're available now!

Azure Migrate for Discovery and Assessment

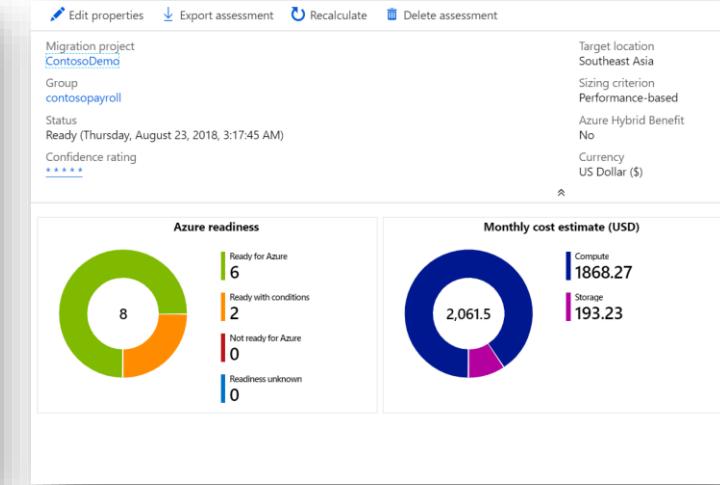
This screenshot shows the 'Discover machines' section of the Azure Migrate interface. It lists various machines with their names, member of groups, cores, memory (MB), and disk counts. A search bar at the top allows filtering by machine name.

NAME	MEMBER OF	CORES	MEMORY (MB)	DISKS
RAMD	mb-test.demotest.azure...	12	16384	3
FW12R2DSSP16-04	mb-test.azuretools.wind...	2	4096	3
FW12R2DSSP13-02	mb-test.azuretools.wind...	2	4096	3
SPChurn	mb-test2.azuretools.win...	4	4096	3
FW12DCR2SQ12-04	azurertools-windows.disc...	2	2048	3
ScaleMon-49	azurertools-windows.disc...	1	2048	1
FC6U7-02	mb-test.mb-test2.red.ha...	2	2048	7
FW12STR2SQ12-01	azurertools-windows.disc...	2	2048	3
FW12STR2SQ12-03	azurertools-windows.disc...	2	2048	3
FW12R2DSSP16-01	azurertools-windows.disc...	2	4096	3
ScaleMon-47	azurertools-windows.disc...	1	2048	1
DiscoveryConnector	testallmachines.manual...	2	2048	5
FW12R2DSSP13-01	azurertools-windows.disc...	2	4096	3
ScaleMon-98	azurertools-windows.disc...	1	2048	3
DataTierVM03	contosopayroll.richeney...	2	2048	1

Agentless
discovery



TCO
calculation



Right-size and
suitability

This screenshot shows the 'Azure platform' configuration section. It includes tabs for 'TARGET DETAILS', 'SIZING', and 'PRICING'. Under 'TARGET DETAILS', the target location is set to Southeast Asia. Under 'SIZING', the sizing criterion is Performance-based, and the VM series selected is 9 selected. Under 'PRICING', the offer is Pay-As-You-Go, currency is US Dollar (\$), and the VM uptime is 31 days per month, 24 hours per day. A note indicates that Azure Hybrid Benefit applies to Windows Server licenses.

Azure
platform

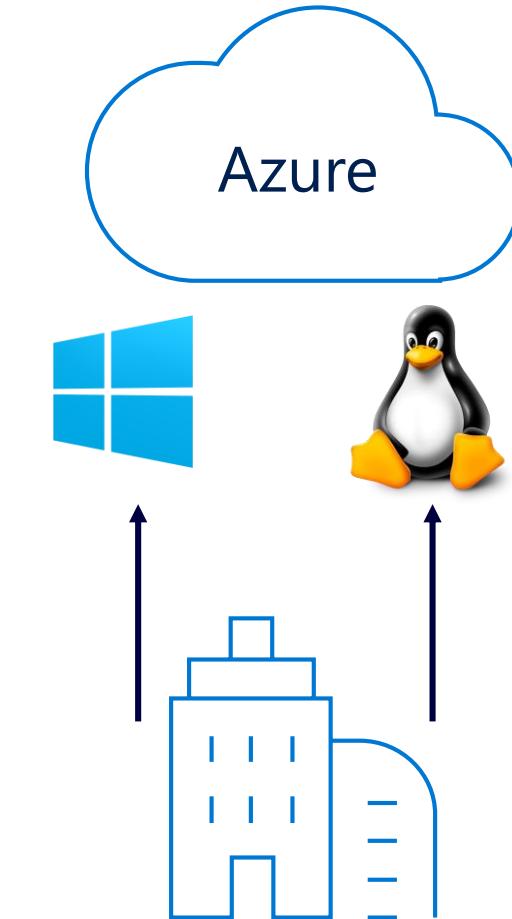
Azure Site Recovery



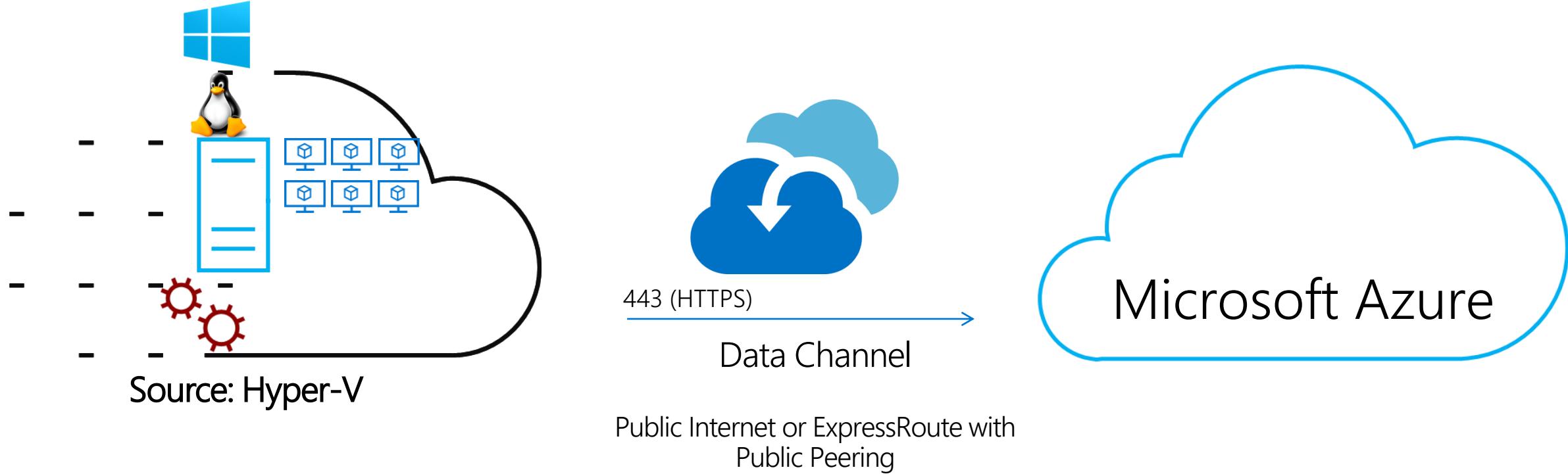
Azure Site Recovery for Server Migration

The Azure Site Recovery Advantage

- Effortless **migration of VMs and apps** to Azure
- Zero application **data loss** during migration
- **Near-zero** application **downtime** during migration
- **Broad coverage** for hypervisors, applications, operating systems, and Azure features
- **No-impact** application **testing** in Azure
- Free usage during migration



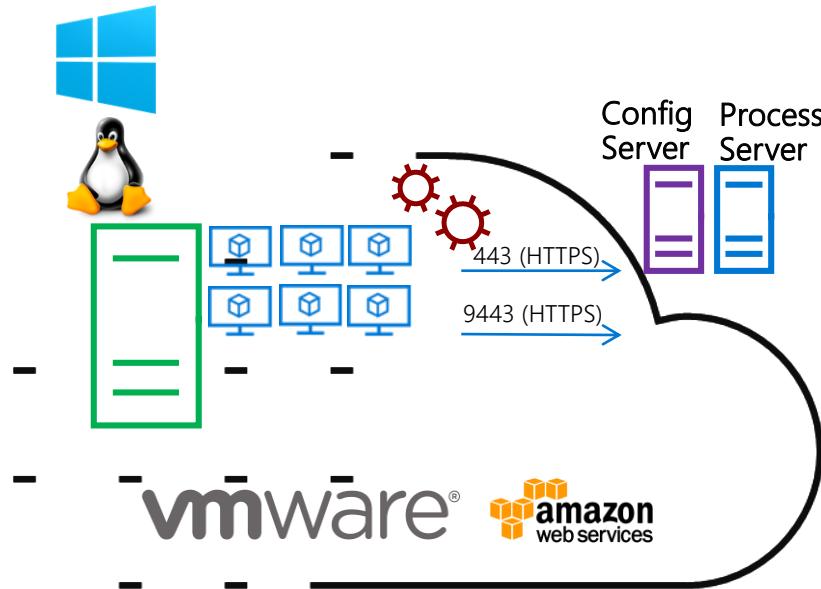
How Hyper-V Migration Works



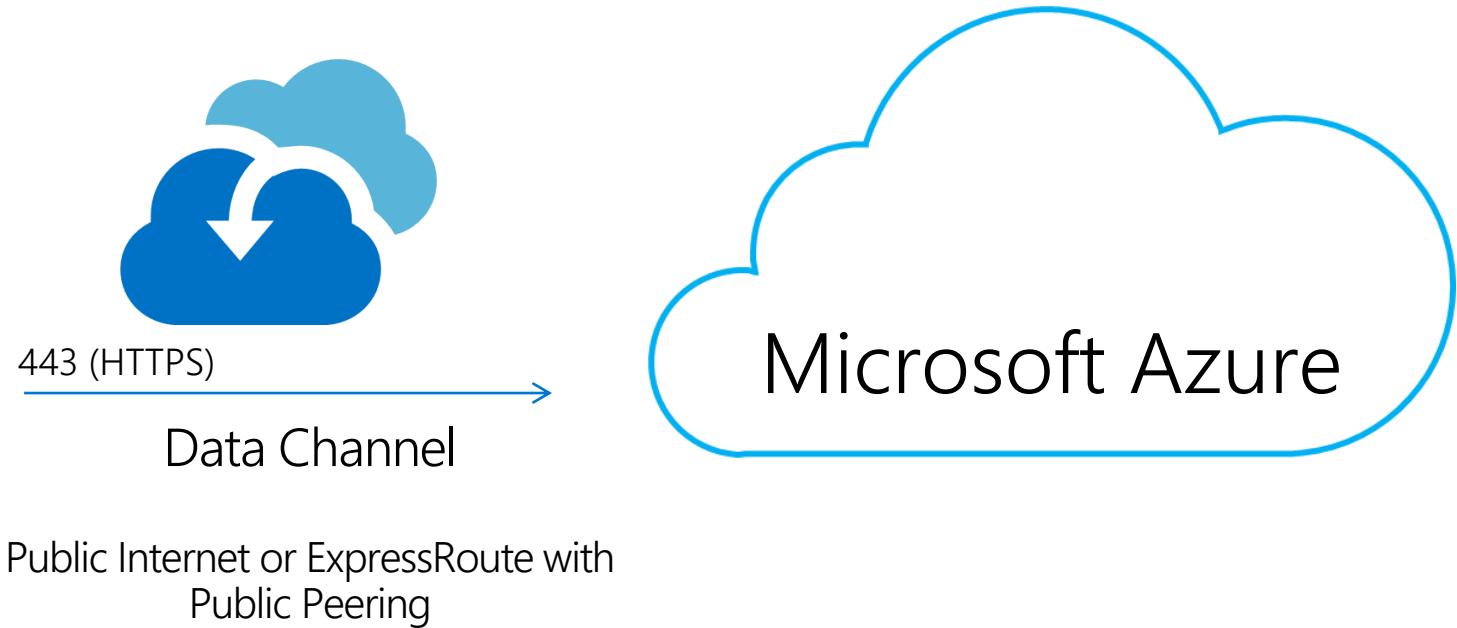
 Microsoft Azure
Recovery Services Agent
Replicates data to Azure

 Documentation: https://aka.ms/asr_hyperv
Videos: https://aka.ms/asr_videos

How VMware Migration Works



Source: VMware, AWS, Physical Servers



 **Process Server**
Used for caching, compression, and encryption

 **Configuration Server**
Used for centralized management

 **Mobility Service**
Captures all data writes from memory

Comprehensive Coverage for VMware

vCenter Server and vSphere support	6.5, 6.0, NEW 6.7, 5.5
Windows Guest OS support	Windows Server 2016 Windows Server 2012 R2 Windows Server 2012 Windows Server 2008 R2 NEW Windows Server 2008 (32-bit and 64-bit)
Linux Guest OS support	RHEL 5.*, 6.*, NEW 6.10 and 7.*, NEW 7.5 Cent OS 5.*, 6.*, NEW 6.10 and 7.*, NEW 7.5 Ubuntu 14.04 and 16.04 LTS NEW SUSE Enterprise Server 12 SP1, SP2, SP3 SUSE Enterprise Server 11 SP3, SP4, 12 SPI OEL 6.4 and 6.5 Debian 7 and 8 support
Azure platform support	Managed Disk Encrypted Storage Azure Hybrid Benefit for Windows Server



Support Matrix

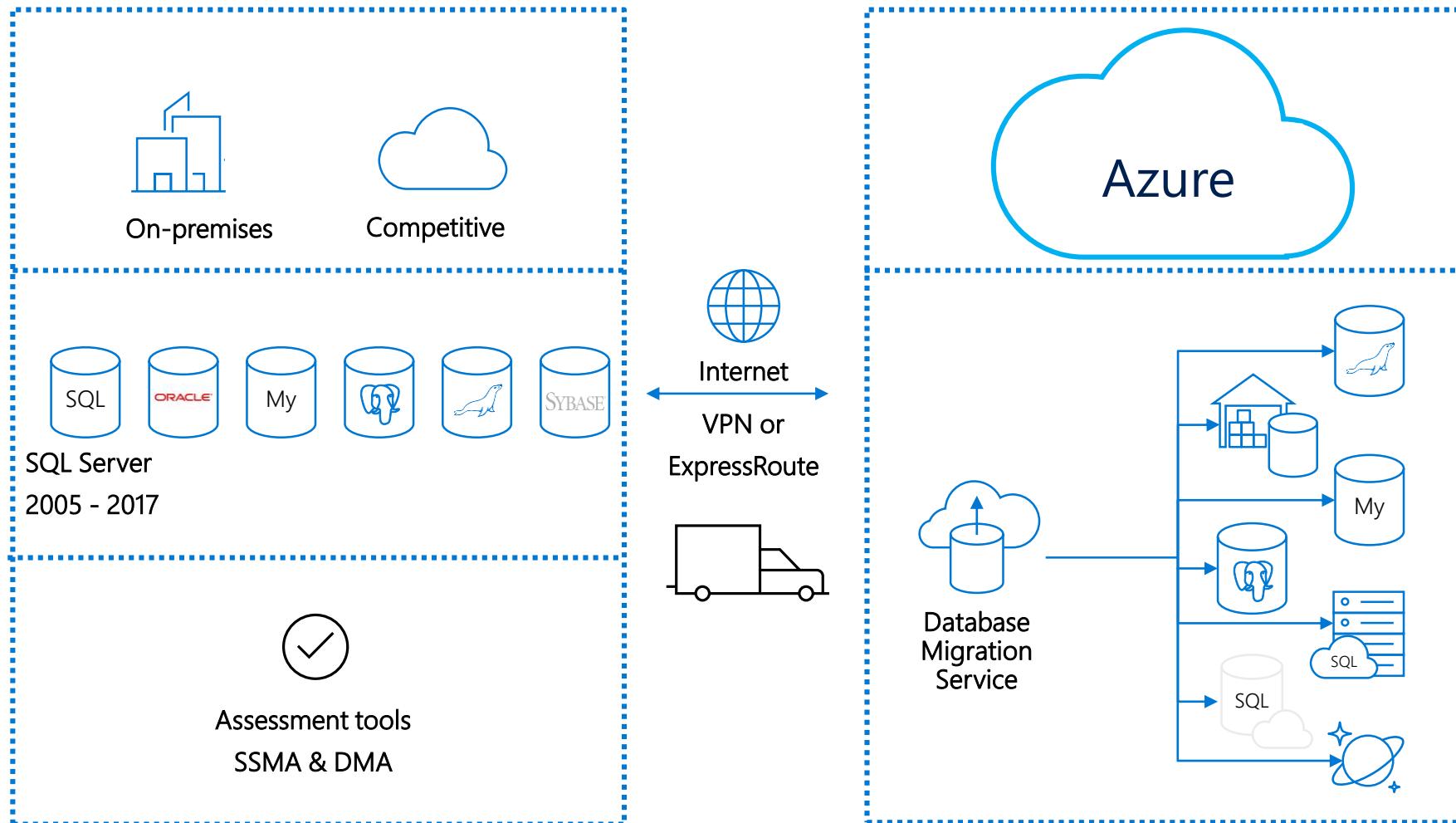
https://aka.ms/asr_supportmatrix

NOTE: Hyper-V migration with Azure Site Recovery supports **every** Windows and Linux OS that is endorsed to run on the Azure Compute platform

Database Migration Service (DMS)



Database Migration Service for Database Migration



- Seamless, end-to-end solution for moving databases to the cloud
- Near-zero downtime as you migrate your business-critical apps
- Migrate at scale from multiple sources to your target database

Database Migration Service Announcements

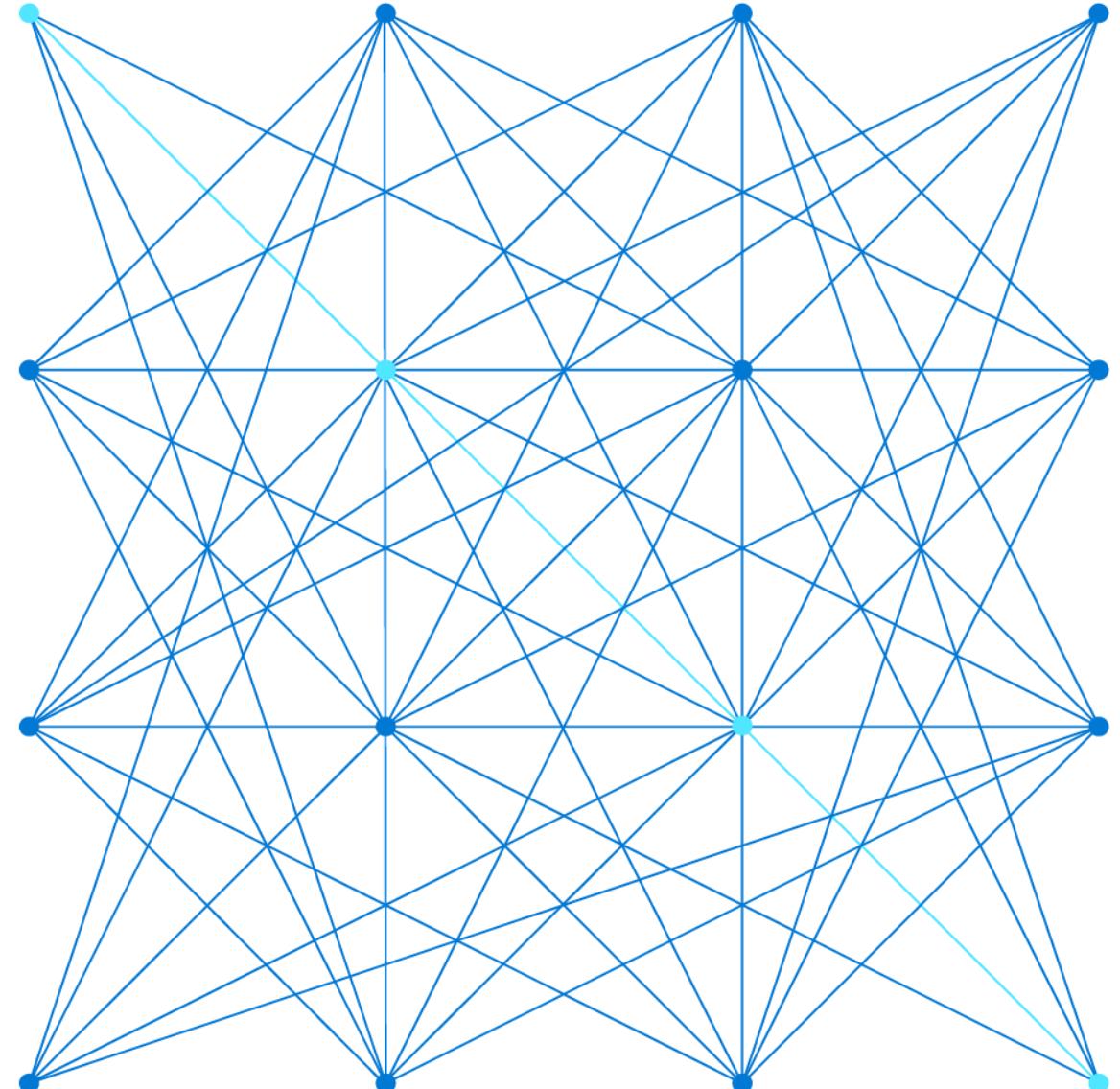
Source	Target	Release Status
SQL Server	Azure SQL Database Managed Instance	NEW Generally Available
MySQL	Azure Database for MySQL	NEW Preview
PostgreSQL	Azure Database for PostgreSQL	NEW Preview
MongoDB	Cosmos DB	NEW Limited preview



Support Matrix

https://aka.ms/dms_supportmatrix

Azure Governance



Subscription modeling strategy

Scaling your use of Azure.

Why scale subscriptions?

- Subscriptions have different quota limits for different resource types
- At a certain level of usage **you will need to create new subscriptions to scale out**, so you need to have a strategy for doing so
 - A very crucial workflow that can slow down a lot of organizations
- Some questions you'll need to answer:
 - Who will be responsible for creating subscriptions?
 - What resources will be in a subscription by default?



Tips for creating new subscriptions

- Customers should have a workflow for this process
 - What do all “standard” subscriptions look like?
 - What RBAC, policies, infra, tags, etc. should each new subscription have?
- Use a service principal for creating new subscriptions if possible
 - <https://docs.microsoft.com/en-us/azure/azure-resource-manager/grant-access-to-create-subscription?tabs=rest>
 - Security group can request new subs through an automated workflow
- Can reach out to support to block non-EA subscriptions from being created
- Enable previews programmatically
 - <https://docs.microsoft.com/en-us/powershell/module/azurerm.resources/register-azurermproviderfeature?view=azurermps-6.13.0&viewFallbackFrom=azurermps-6.12.0>

Subscription modeling strategy

What defines an app in your organization?



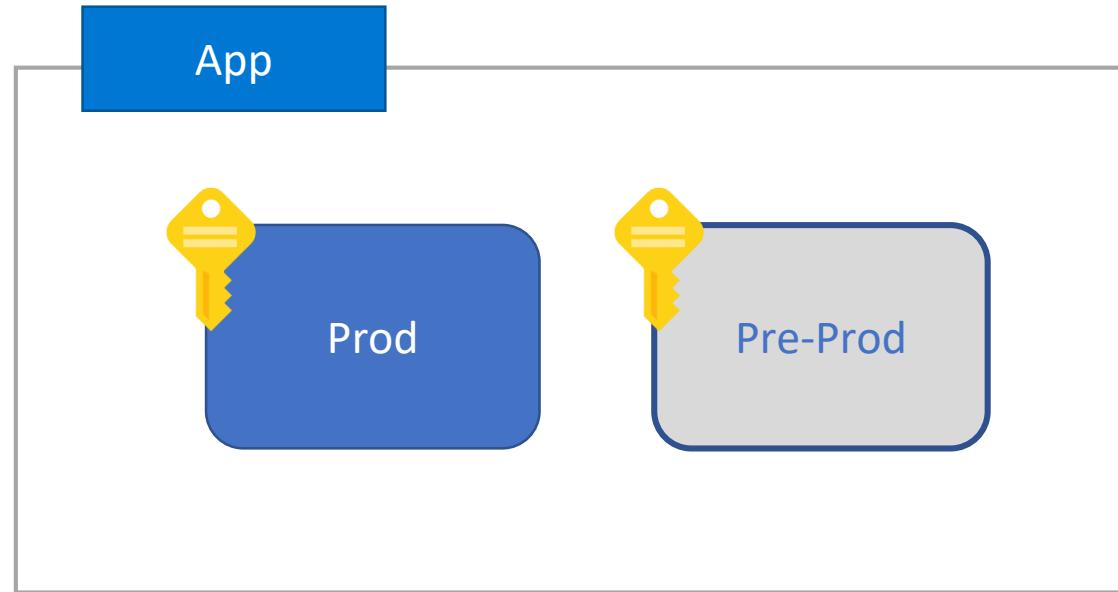


Subscription

Subscription modeling strategy

What defines an app in your organization?

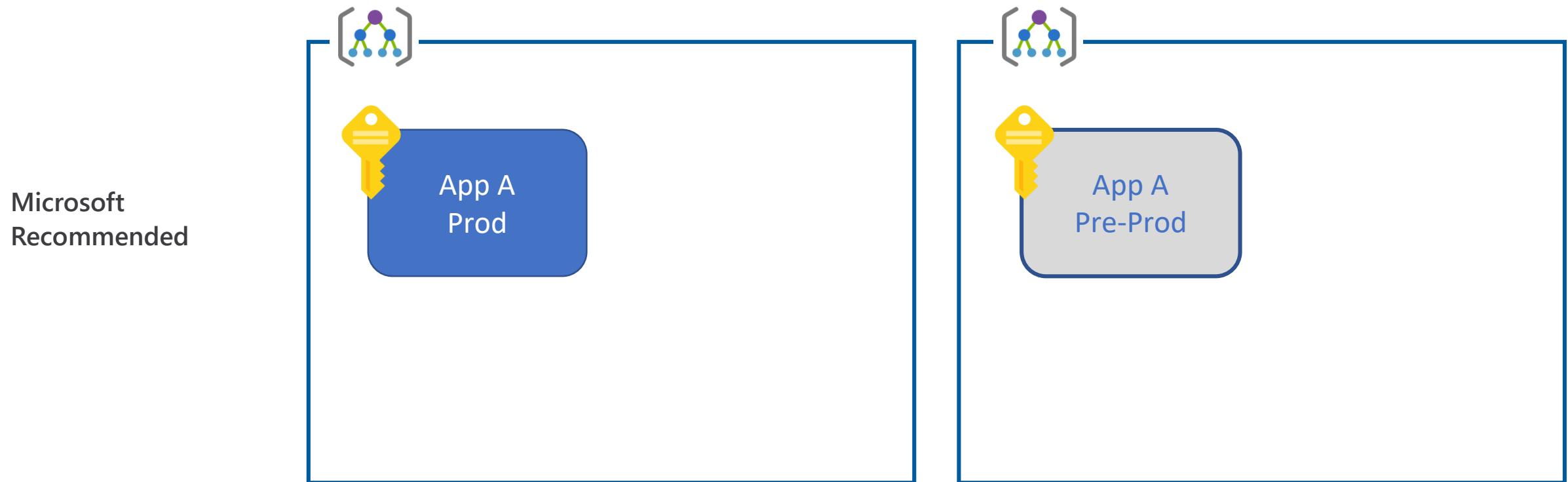
Microsoft
Recommended



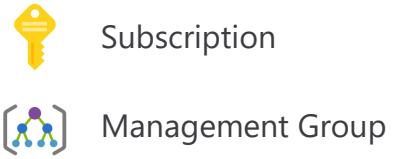
Subscription modeling strategy

 Subscription

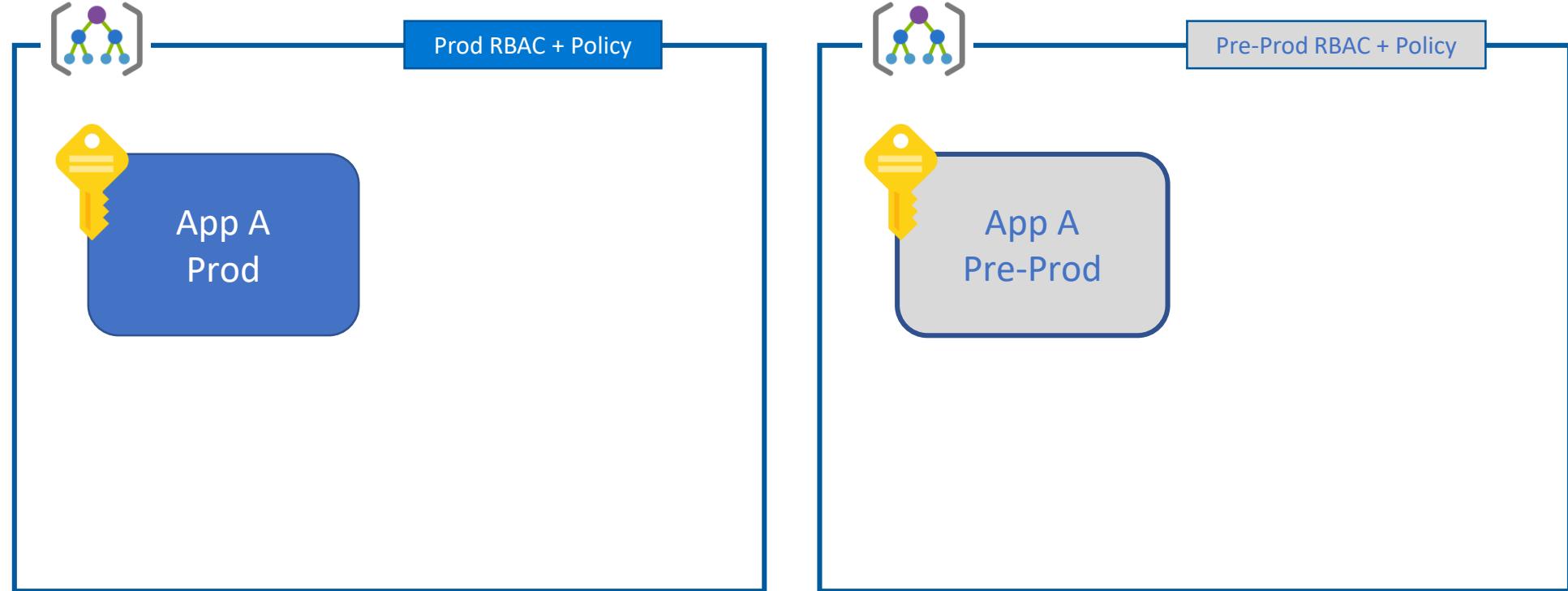
 Management Group



Subscription modeling strategy



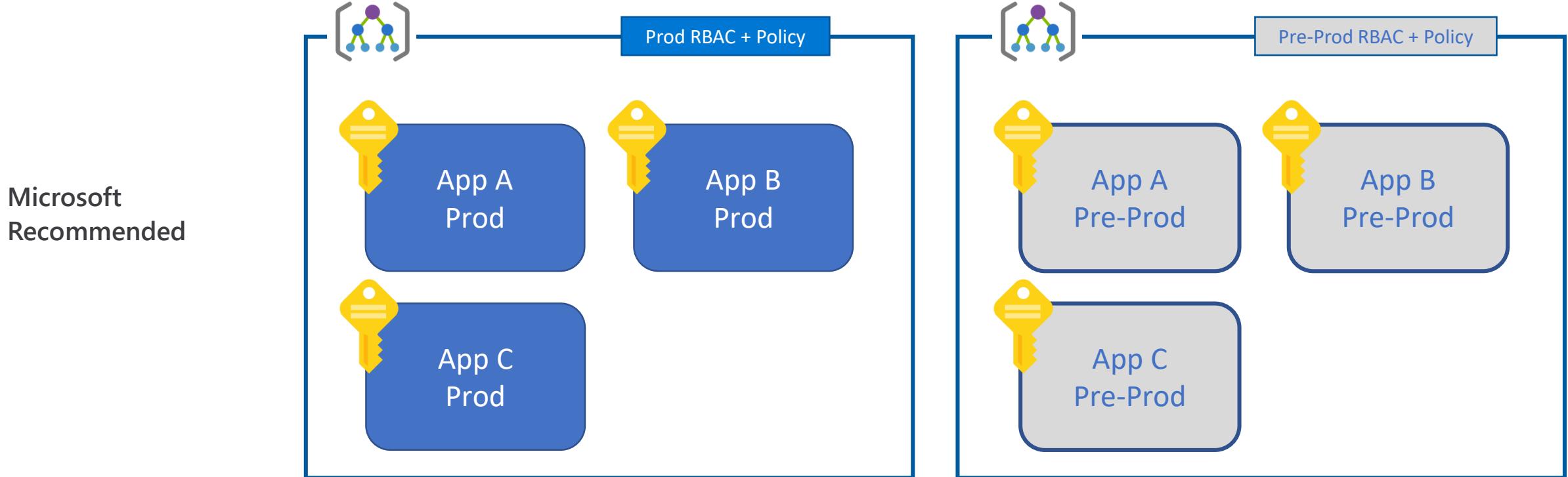
Microsoft Recommended



Subscription modeling strategy

Subscription

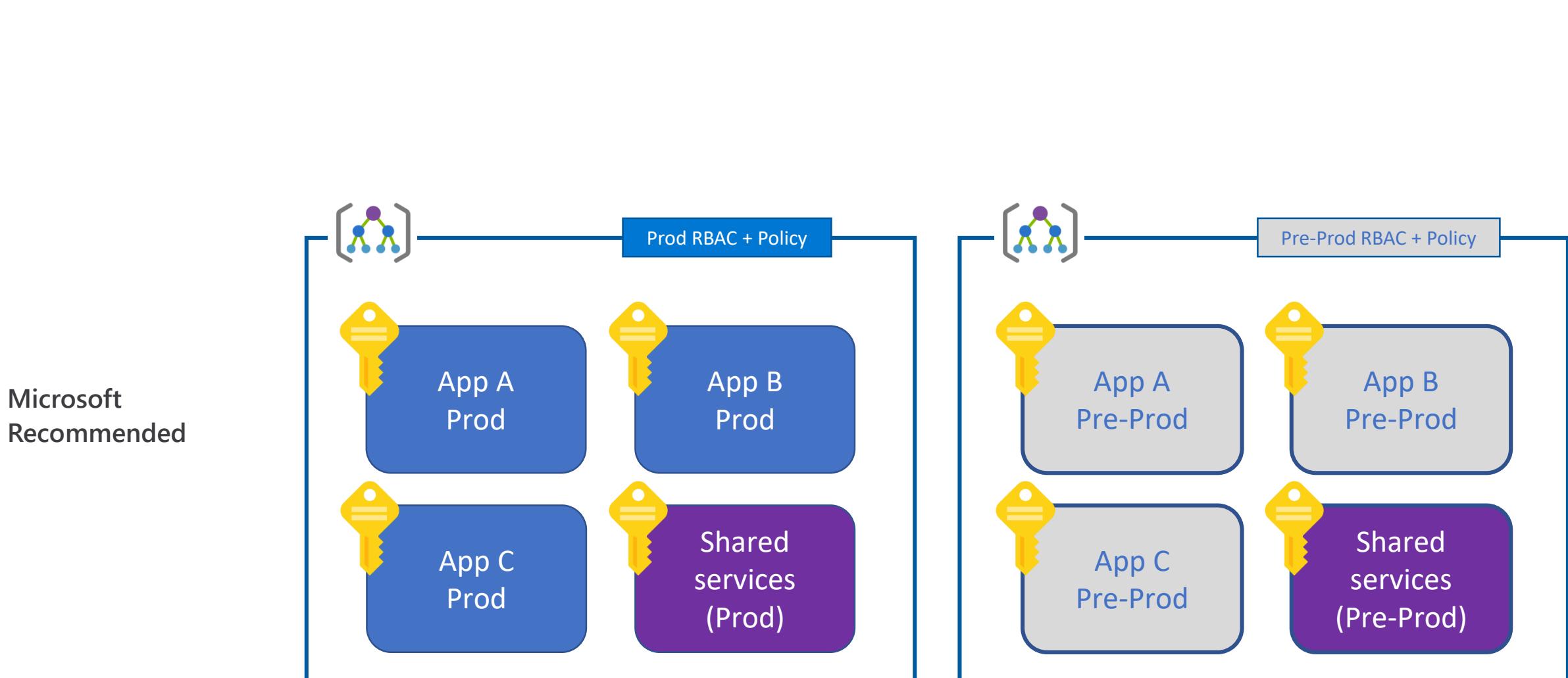
Management Group



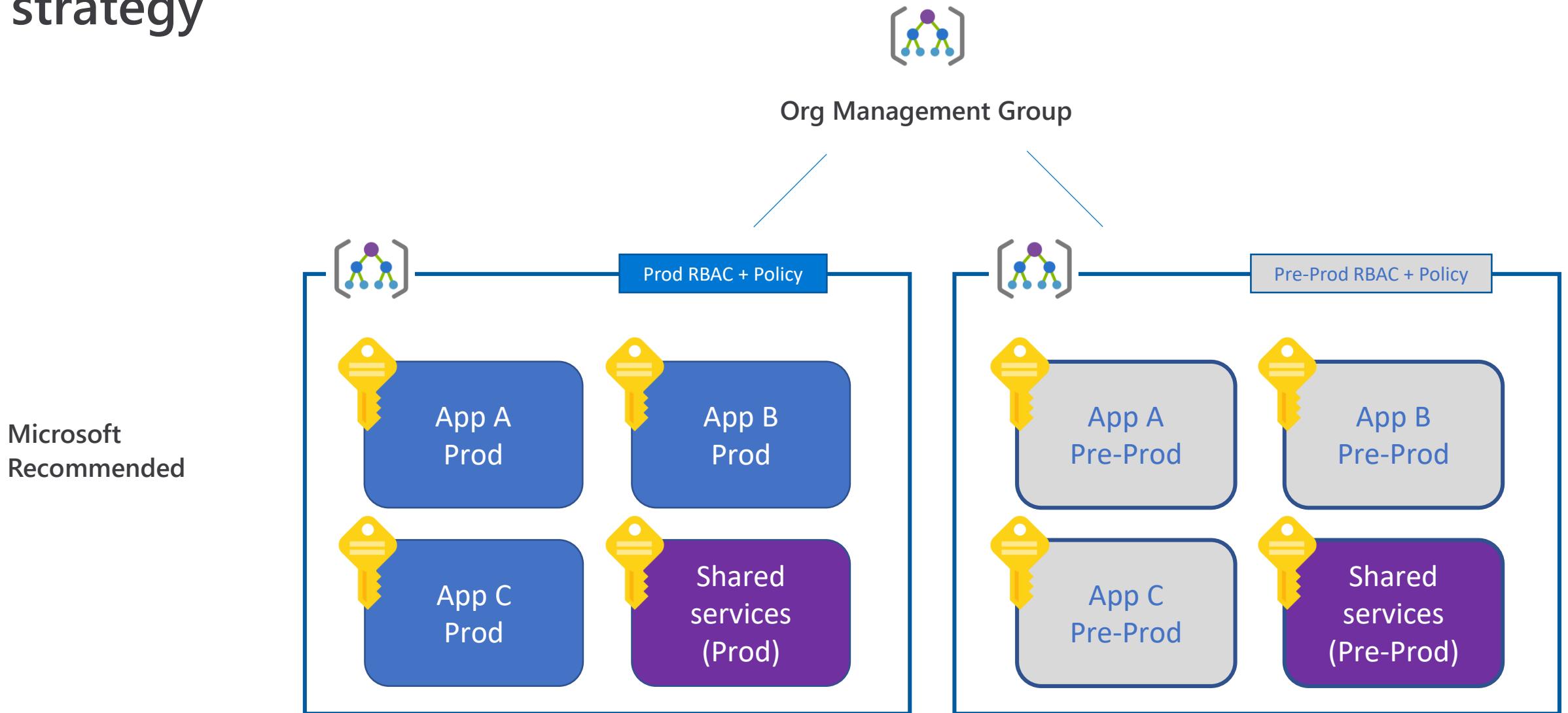
Subscription modeling strategy

Subscription

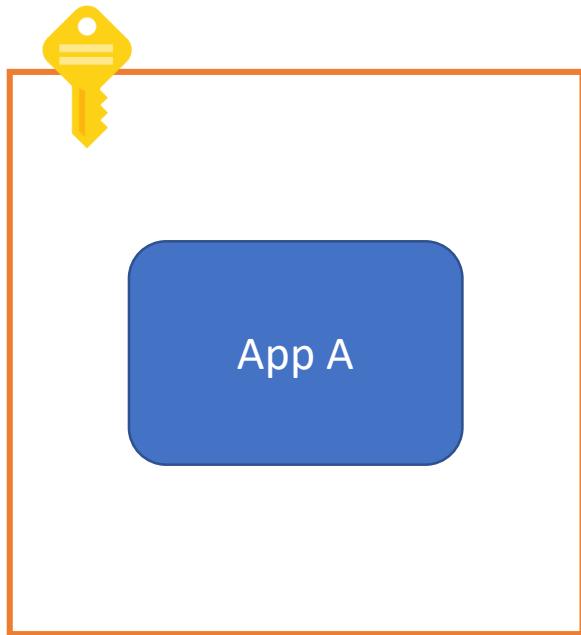
Management Group



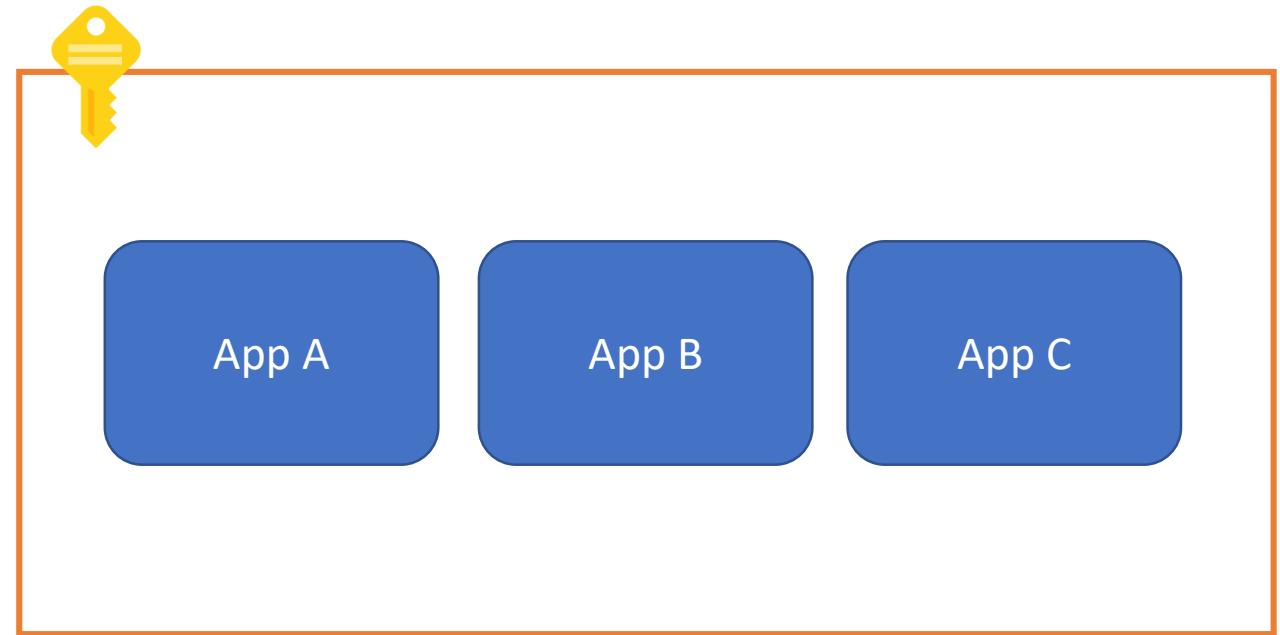
Subscription modeling strategy



Alternative modeling strategies



One subscription per app



Shared subscription with many apps

Subscription modelling gaps

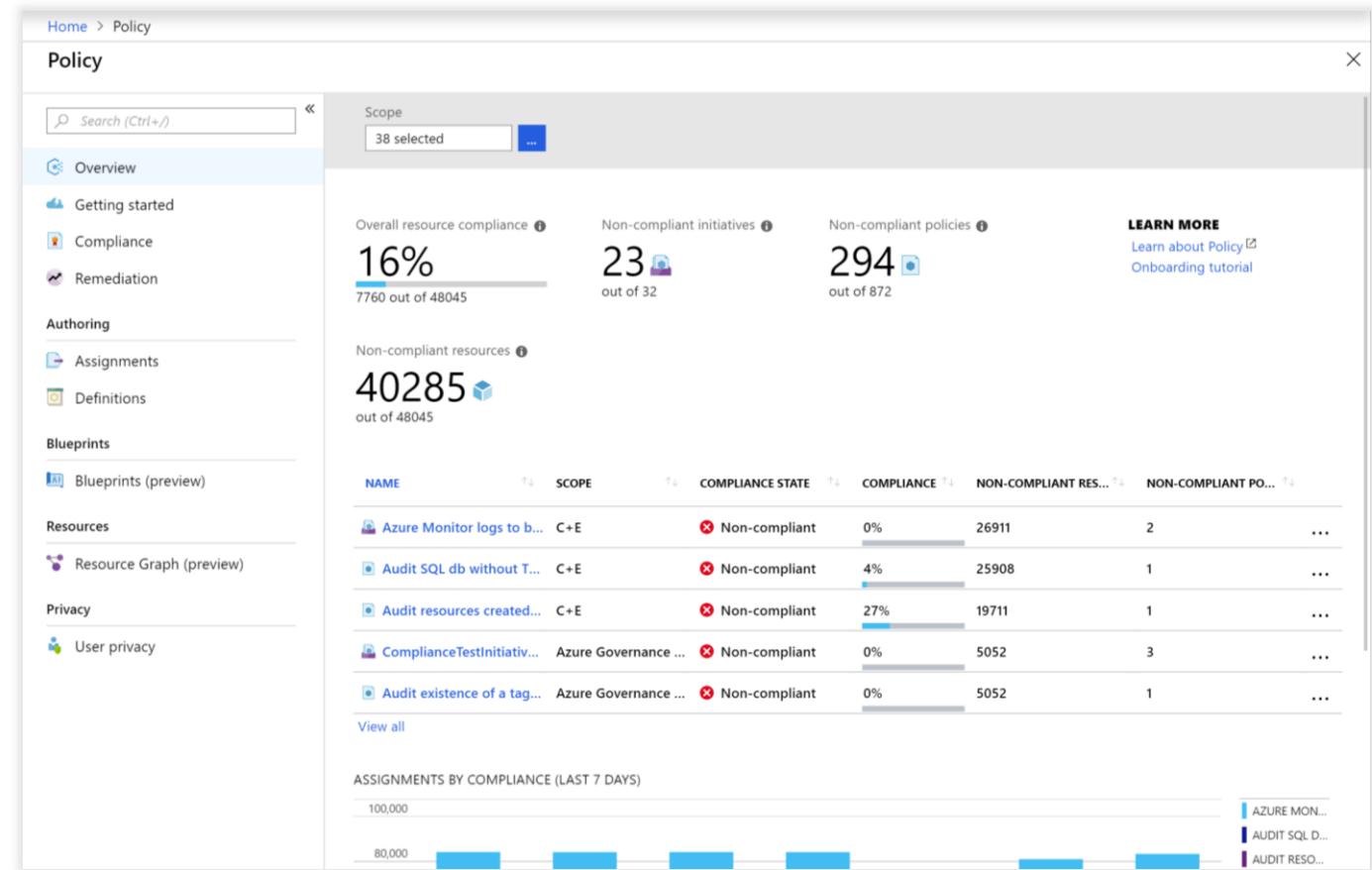
- Limitation of 100 VNET peers
- Subscription API limitations
 - 50 subscription creations by default
 - Can be raised to 200 per account
- Raising quotas
 - There will be an RP for raising quota limits

Azure Policy



Policy key info

- No other platform can do real time Policy enforcement
- No other cloud offers at-scale compliance assessment (and it's FREE for Azure!)
- Policy evaluates all Azure resources & in-guest VM
- Policy generate compliance events that can be used for alerting
- Aggregated and raw compliance data are available through API, Powershell & CLI
- Can be used to automatically remediate problems in your environment



Policy scenarios

- Restrict location or resource type (built-in)
- Inherit tags from Resource Group (see right ->)
- Block 'open to any' NSG rule creation ([Github](#))
- Enable diagnostic logs at-scale ([MVP blog](#))
- Security (built-in from Azure Security Center & In-Guest)

```
{  
  "mode": "indexed",  
  "policyRule": {  
    "if": {  
      "field": "tags.costCode",  
      "exists": "false"  
    },  
    "then": {  
      "effect": "append",  
      "details": [  
        {  
          "field": "tags.costCode",  
          "value": "[resourcegroup().tags.costCode]"  
        }  
      ]  
    }  
  }  
}
```

Policy best practices

- Start with Audit Policies, which is a safe way of understanding what a policy will do without affecting user activity
- Used staged rollouts for Deny policies to understand impact
- Rollout remediation in stages

Details [Definition \(JSON\)](#)

Duplicate this policy definition

```
1 {
2   "if": {
3     "anyOf": [
4       {
5         "allOf": [
6           {
7             "field": "type",
8             "equals": "Microsoft.Compute/virtualMachines"
9           },
10          {
11            "field": "Microsoft.Compute/virtualMachines/osDisk.",
12            "exists": "True"
13          }
14        ],
15        "allOf": [
16          {
17            "field": "type",
18            "equals": "Microsoft.Compute/VirtualMachineScaleSet"
19          },
20          {
21            "anyOf": [
22              {
23                "field": "Microsoft.Compute/VirtualMachineScale",
24                "exists": "True"
25              },
26              {
27                "field": "Microsoft.Compute/VirtualMachineScale",
28                "exists": "True"
29              }
30            ],
31          }
32        ]
33      }
34    ],
35  },
36  "then": {
37    "effect": "audit"
38  }
39}
40
41}
```

Migration Labs 1, 2, & 3

<https://one-commercial-partner.github.io/OCPSScale/Azure/BootCamps/HybridCloud/>